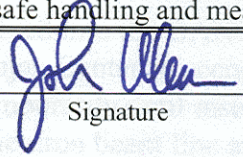
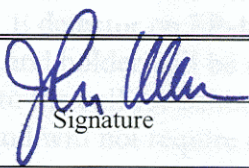
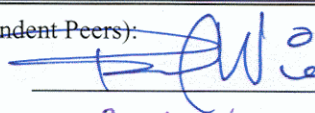

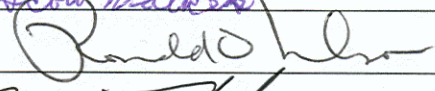
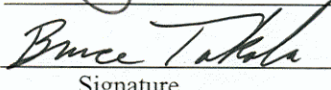
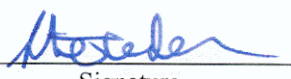


Hazard Control Plan Cover Sheet LANSCE Division

Title of Hazard Control Plan: Removing and Installing γ and β emitting Samples at DANCE			
Hazard Control Plan Identification Number: LANSCE-3 HCP-22 Rev 1			
Brief Description of Work: Target samples to be studied using the DANCE detector must be inserted into the FP14/DANCE vacuum system. Targets will be fabricated and assembled at TA-48 or elsewhere and transported to the Lujan Center. Radioactive targets of sufficient activity will be enclosed in the DANCE Radioactive Target Holder, an enclosed container, for safe handling and measurement.			
Principal Author of the Plan:			
<u>John Ullmann</u>	<u>Scientist/ Staff Member</u>		<u>12/14/03</u>
Name	Title	Signature	Date
Hazard Analysis Performed by:			
<u>John Ullmann</u>	<u>Scientist/Staff Member</u>		<u>12/14/03</u>
Name	Title	Signature	Date
HCP Reviewed by (Subject Matter Experts and Independent Peers):			
<u>Paul Wiemann</u>	<u>LANSCE-12 Safety Officer</u>		<u>12/11/03</u>
<u>Scott Walker</u>	<u>ESH-1</u>		
<u>Ron Nelson</u>	<u>LANSCE-12 Lujan Center EAM</u>		
<u>Bruce Takala</u>	<u>LANSCE-3 Safety Officer</u>		<u>12-11-03</u>
Name	Title	Signature	Date
Initial Risk Estimate: <input type="checkbox"/> Minimal <input type="checkbox"/> Low <input checked="" type="checkbox"/> Medium			
Applicable Safety Permits Required to Perform Work: Experiment-specific Radiological Work Permit			
Residual Risk Estimate: <input type="checkbox"/> Minimal <input checked="" type="checkbox"/> Low <input type="checkbox"/> Medium			
Work Authorization:			
<u>Steve Wender</u>	<u>LANSCE-3 Group Leader</u>		<u>12/14/03</u>
Name	Title	Signature	Date
Next Authorization Review Date: Oct. 1, 2004.			

1.0 Define the Work.

- 2.□ This HCP covers the handling and irradiation of radioactive targets at the DANCE detector on FP-14 at the Lujan Center, and addresses targets that are primarily beta or gamma emitters; alpha emitters are covered in a separate HCP. The detailed radiological controls will be addressed in a separate RWP.
- Target samples that are determined to present minimal initial risk will not require an experiment-specific RWP, and will not require the controls specified in this HCP. This determination will be made in consultation with HSR-1 staff.
 - Targets that present only a low initial risk will not require the use of the radioactive target holder, although it may be used if desired.

B. Radioactive targets will be fabricated and assembled into the DANCE Radioactive Target Holder at TA-48 or elsewhere, transported to the Lujan Center in accordance with Laboratory and DOT procedures and regulations, and stored temporarily until inserted into the beam.

C. The targets must be inserted into the evacuated neutron beam line at DANCE.

D. The experiment will be done using the DANCE detector on FP-14 at the Lujan Center.

E. When the experiment is completed, the target and holder will be removed from the beamline

F. Sealed radioactive sources that are inserted into the ball for calibration measurements will not normally require an experiment-specific RWP, and will not require the controls specified in this HCP.

2.0 Hazard Identification and Control

Hazard	Evaluation	IRL	Control	
Contamination of inside of beam pipe due to broken target .	Radioactive target material detached from target, broken target could contaminate inside of beam pipe. This contamination could be spread when the pipe is opened or when the vacuum is drawn.	Medium	<ol style="list-style-type: none"> 1) Use DANCE Radioactive Target Holder which provides partial secondary containment. See procedure in Section 5. 2) Additional contamination controls specified in RWP. 3) Note that if the beam pipe becomes contaminated and in situ cleanup is determined to be inadvisable, the entire pipe (including target and holder) can be sealed and removed as a single unit. 4) The vacuum pump used on the beam pipe must be vented through a HEPA filter. Additional actions may be required by the RWP. 	low
External dose from radioactive target.	Beta and gamma emitters can cause external dose to workers, depending on energy and activity.	low to medium	<ol style="list-style-type: none"> 1) Target handling will be done according to ALARA principles. Specific procedures will depend on target dose equivalent, which depends on activity, emitted particles, and their energy, and will be specified in an experiment-specific RWP. 	low

2.1 Risk Estimate.

The initial risk estimate is **Medium**, based on the possibility of contamination. The residual risk estimate is **Low**, based on the engineering and administrative controls.

3.0 Waste Generation, Minimization and Management

3.1 Characterization and Storage

Potential Waste Generation	Potential Waste Profile
Routine PPE (gloves, etc.)	None

3.2 Minimization

Waste generation will be minimal: PPE such as gloves, floor coverings, etc. The use of these materials will be kept to a minimum, but consistent with good practice and radiological considerations as specified in the experiment-specific RWP.

4.0 Required skills and training requirements

Radiation Worker

TA 53 Site-specific training (ER1/ER2)

5.0 Procedural Steps

A. Receiving and shipping target

The radioactive targets must be shipped according to DOT and laboratory requirements. They may be received by the experimenter at ER-2, but the experimenter must insure that they are surveyed by an RCT within 8 hours of their receipt. Note that this can be readily accomplished by delivery of the targets to an RCT or to the HSR-1 Field Office. The RCT will swipe the shipping container, according to procedure. If the target can be received, it will be stored temporarily in the radioactive material cabinet at FP14. If it cannot be received, it will be returned to the shipper.

NOTE: The target holder itself is inside a plastic transfer case (the RTHC), which can be visually inspected to insure target and target holder integrity. Receiving swipes should be done on the inside of the RTHC.

B. Inserting a target into the beam pipe

1. Personal protective equipment will be specified by an experiment-specific RWP. It is anticipated that the minimal requirement will be gloves, but safety glasses and other protective equipment may be required.
2. Contamination control measures will be specified by the RWP. These may include floor covering under the work area and step-off pads.
3. After closing the vacuum valves and venting the beam line to air, the beam-pipe spool piece will be removed for access.
4. The inside of the beam pipe which goes through the ball will be swiped for reference. If contamination is found, this procedure will be halted until the source of the contamination is determined, and decontamination completed.
5. Bring the target from the temporary storage location into the cave. The target should still be

- enclosed in the RTHC and may (for ALARA) be in the outer shipping container.
6. Visually inspect the RTH in the RTHC, and then open the RTHC (over the removable floor covering if required) and swipe the inside of both pieces of the RTHC. The target and RTH should be held in the end of the RTHC that is not being swiped. If these swipes are positive, the RTHC should be closed and sealed, and this procedure halted.
 7. Remove the RTH from the RTHC and insert it into the beam pipe, taking care that the steel chip is on the downstream edge to enable removal. Slide the RTH into position using the special plunger.
 8. Replace the removable beam line spool piece and pump out the vacuum system. The vacuum should be pumped slowly to minimize the stress on the RTH windows.

NOTE: If contamination is found on the RTH or RTHC in step 6, the target holder (RTH) should be sealed into the RTHC and prepared for shipment back to TA-48 or other assembly area. This preparation may include additional bagging and swipes as determined to be necessary by RCT procedures.

C. Removing a target from the beam pipe

1. Personal protective equipment will be specified by the experiment-specific RWP. It is anticipated that the minimal requirement will be gloves, but safety glasses and other protective equipment may be required.
2. Contamination control measures will be specified by the experiment-specific RWP. These may include floor covering under the work area and step-off pads.
3. Remove the short removable spool piece and store on the floor covering if used.
4. Swipe the inside of the spool piece and the beam pipe which goes through the ball. If contamination is found, stop the procedure, and secure the beam pipe either with the spool piece, vacuum blank-off flanges, or plastic wrap. Assess the contamination levels and determine action in consultation with an RCT. Note that the beam pipe assembly may be sealed and removed for decontamination or disposal.
5. Carefully remove the RTH from the pipe using the magnetic withdrawal tool.
6. Swipe the aluminum surface of the target holder (RTH).
7. Insert the RTH into the plastic RTHC, close the RTHC, and return it to the locked temporary storage cabinet.

D. Vacuum Integrity

1. The vacuum pump that pumps on the portion of the beam line containing the target must vent through a HEPA filter.
2. The HEPA filter exhaust may be required to have a continuous air monitor, this will be specified in the experiment-specific RWP.
3. In case of contamination in the beam pipe, the vacuum pump must be assumed to be contaminated and evaluated.
4. In case of catastrophic failure of the vacuum system, such as due to puncture of one of the windows to air, it is likely that the target will be compromised and the entire beam pipe must be initially assumed to be contaminated. It must then be evaluated section by section.

6.0 Emergency Procedures

EMERGENCY CONTACTS AND PHONE NUMBERS

(Post Onsite)

MEDICAL EMERGENCY/FIRE: **8-911 (NOTE: Emergency calls made to 911 from cellular phones reach a dispatcher located in Santa Fe; therefore, callers must indicate that the call is from Los Alamos).**

HAZARDOUS RELEASE/SPILL:

LANL HAZMAT Team (EM&R) **667-6211**

Support Contacts:

LANSCCE 6 Central Control Room **667-5729**

LANL Occupational Medicine Clinic (HSR-2)..... **667-7848**

Los Alamos Medical Center Hospital..... **662-2455**

Security OS/Pro Force **667-6534**

Los Alamos Police **662-8222**

Emergency Contacts:

Principal Investigator: John Ullmann..... **667-2517/662-7573**

LANSCCE-3 Safety Officer: Bruce Takala **665-2029**

LANSCCE-3 Group Leader: Steve Wender **667-1344**

LANSCCE-12 Experimental Area Manager: Ron Nelson **665-1666 / 996-379**

HSR-1 Staff Member: Scott Walker **665-0857 / 104-6951**

LANSCCE-12 Safety Officer: Paul Wiemann **667-2334 / 104-8386(D)**

EMERGENCY REPORTING INFORMATION:

When calling for emergency services, have the following information available to report:

- Site name/location/phone #
- Number of personnel involved
- Caller ID
- Name and condition of affected employees
- Nature of emergency
- Actions taken and assistance required

The individual who authorizes this work (based on the residual risk level) shall indicate so by signature on the HCP Cover Sheet. In addition, once the HCP has been reviewed with workers who will execute the work, workers shall sign the attached worker authorization sheet after obtaining authorization from their supervisor/manager at the appropriate level.

Residual Risk: Low

Signature below indicates that the employees listed have read this HCP, have had an opportunity to discuss hazards and controls with the work supervisor, been authorized by their supervisor/management, and understand their responsibilities relative to hazard control. These individuals are authorized to perform appropriate duties specified by the HCP.

[illegible]